MEMORANDUM

TO: Terry Taylor
Anderson, Mulholland and Associates

DATE: December 22, 2011

FROM: R. Infante

FILE: JA94124

RE: Data Validation
BMS-IMC, Humacao, PR
Building 5
Accutest Job Number: JA94124

SUMMARY

Full validation was performed on the data for eleven (11) soil samples, one (1) trip blank, (1) field blank, and one (1) equipment blank analyzed for selected volatile organic compounds using EPA method SW-846 8260B and eleven (11) soil samples and one (1) equipment blank analyzed for alcohols (methanol and isopropyl alcohol) by EPA method SW-846 8015 (DAI). The samples were collected at the BMS-IMC Building 5 Area in Humacao, PR on December 7 and 8, 2011 and submitted to Accutest Laboratories that analyzed and reported the results under delivery group (SDG) JA94124.

The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: "*USEPA Region 2, SOP HW-24, Standard Operating Procedure for the Validation of Organic Data Acquired using SW-846 Method 8260B (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Low Concentration Organic Data Review (August 2009-Revision 2)*, the *USEPA National Functional Guidelines for Organic Data Review for Low Concentration (SOP HW-13, August 2009-Revision 3)* (noted herein as the "primary guidance document"). Also, QC criteria from *"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update III, December 1996),"* are utilized. The guidelines were modified to accommodate the non-CLP methodology. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.

In general the data is valid as reported and may be used for decision making purposes. The data results are acceptable for use. Some of the results were qualified.

SAMPLES

The samples included in the review are listed below

FIELD SAMPLE ID	LABORATORY ID	ANALYSIS
I-12 (9.5 - 10.5)	JA94124-1	VOCs, ALCOHOLS
I-13 (12.5 - 13.5)	JA94124-2	VOCs, ALCOHOLS
I-14 (8.5 - 9.5)	JA94124-3	VOCs, ALCOHOLS
I-15 (5 - 6)	JA94124-4	VOCs, ALCOHOLS
I-16 (6 - 7)	JA94124-5	VOCs, ALCOHOLS
I-17 (10 - 11)	JA94124-6	VOCs, ALCOHOLS
I-18 (7 - 8)	JA94124-7	VOCs, ALCOHOLS
I-19 (8 - 9)	JA94124-8	VOCs, ALCOHOLS
EB120811	JA94124-9	VOCs, ALCOHOLS
P-9 (4.5 - 6)	JA94124-10	VOCs, ALCOHOLS
P-8 (4 - 5)	JA94124-11	VOCs, ALCOHOLS
P-5 (4.5 - 5.5)	JA94124-12	VOCs, ALCOHOLS
FB120811	JA94124-13	VOCs
TB120811	JA94124-14	VOCs

REVIEW ELEMENTS

Sample data were reviewed for the following parameters, where applicable to the method

- Agreement of analysis conducted with chain of custody (COC) form
- Holding time and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks/trip blanks/field blank
- Surrogate spike recovery
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Internal standard performance
- Field duplicate results
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results

- Quantitation limits and sample results

DISCUSSION

Agreement of Analysis Conducted with COC Request

Sample reports corresponded to the analytical request designated on the chain-of-custody form.

Holding Times and Sample Preservation

The cooler temperatures were within the QC acceptance criteria of 4°C ± 2°C.

Sample preservation was acceptable.

Samples analyzed within method recommended holding time.

GC/MS Tunes

The frequency and abundance of bromofluorobenzene (BFB) tunes were within the QC acceptance criteria. All samples were analyzed within the tuning criteria associated with the method.

Initial and Continuing Calibrations

VOCs

The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard. All initial and continuing calibrations met the acceptance criteria except for the following analytes:

DATE	LAB FILE ID#	CRITERIA OUT: %D	COMPOUND	AFFECTED SAMPLES
12/12/11	cc435-20	- 23.6	MIBK	JA94124-9; -13; -14

Qualify results (J) in affected samples.

Alcohols

The percent relative standard deviations (%RSDs) and response factors (RFs) of all target analytes were within the QC acceptance criteria in the initial calibration. Correlation coefficients (r^2) of target analytes were within the QC acceptance criteria. Ongoing accuracy of the instrument was determined by the analysis of a continuing calibration standard. All initial and continuing calibrations met the acceptance criteria

Method Blank/Trip Blank/Field Blank

Target analytes were not detected in laboratory method blanks for VOCs and alcohols.

No target analytes (VOCs) in the trip/field/equipment blanks associated with this data set.

No target analytes (ALCOHOLS) in the equipment blank associated with this data set. No trip/field blanks associated with this data set were analyzed for alcohols.

Surrogate Spike Recovery

The surrogate recoveries were within the laboratory QC acceptance limits in all samples analyzed for VOCs and alcohols except for the followings:

- JA94124-6 for Hexanol: Outside control limits due to matrix interference. Confirmed by MS/MSD.
- JA94124-6MS for Hexanol: Outside control limits due to matrix interference.
- JA94124-6MSD for Hexanol: Outside control limits due to matrix interference

No action taken; surrogates recoveries within control limits in signal #2,

MS/MSD

VOCs

Matrix spike was performed on samples JA93776-3MS/-3MSD (Aqueous); JA94124-5MS/-5MSD (Soil); and JA94124-3MS/-3MSD. Recoveries and RPD for the MS/MSD were within laboratory control limits except for the followings:

MS OR MSD JA94124-5	COMPOUND	% R	RPD	QC LIMITS	ACTION
MS	Ethylbenzene	172		20 - 144	Qualify results (J)
MS	Toluene	146		29 - 138	affected samples
MS	Xylenes(Total)	176		18 - 145	

Affected samples: JA94124-2; -3; -4; -5; -7; -8; -11; -12

Alcohols

Matrix spike was performed on samples JA93907-1MS/1MSD (Aqueous) and JA93968-1MS/-1MSD (Soil). Recoveries and RPD for the MS/MSD were within laboratory control limits.

Internal Standard Performance

VOCs

Samples were spiked with the method specified internal standard. Internal standard performance met the QC acceptance criteria in all sample analyses.

Laboratory/Field Duplicate Results

Laboratory duplicate associated with data package were samples JA94124-4 (VOCs). RPD results were within laboratory and generally acceptable control limits except for the followings:

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Benzene	0.14	0.76	0.31	84	Qualify results (J) in sample JA94124-4
Ethylbenzene	0.15	0.38	ND	200	
Xylene(total)	0.19	7.5	2.0	116	

Note: laboratory states that: "High RPD due to possible sample analyzed from different vials"; therefore results qualified based on professional judgment

No field/laboratory duplicates were analyzed for alcohols in this data set. MS/MSD results used to assess precision. RPD results were within laboratory and generally acceptable control limits.

LCS/LCSD Results

VOCs

The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Alcohols

The laboratory analyzed one LCS (blank spike) associated with each matrix from this data set. The % recoveries of all spiked analytes were within the laboratory QC acceptance limits.

Quantitation Limits and Sample Results

Dilutions were not required with this data set except for the following samples (alcohols):

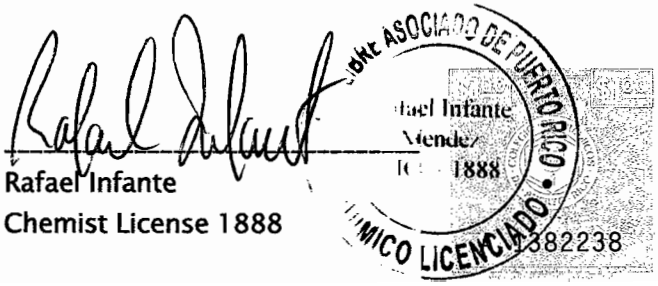
SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
JA94124-6	10 x	Ethylbenzene and total xylenes outside calibration range
JA94124-10	10 x	MIBK and total xylenes outside calibration range

Calculations were spot checked.

More than 40 % RPD for detected Isopropyl Alcohol concentrations between the two GC columns in samples JA94124-1. Results qualified as estimated (J).

Certification

The following samples JA94124-1; JA94124-2; JA94124-3; JA94124-4; JA94124-5; JA94124-6; JA94124-7; JA94124-8; JA94124-9; JA94124-10; JA94124-11; JA94124-12; JA94124-13; and JA94124-14 were analyzed following standard procedures accepted by regulatory agencies. The quality control requirements met the methods criteria except in the occasions described in this document. The results are valid.



Rafael Infante
Chemist License 1888

Report of Analysis

Client Sample ID:	I-12(9.5-10.5)		
Lab Sample ID:	JA94124-1	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	87.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E185931.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180
Run #2	E185929.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.4 g	5.0 ml	2.0 ul
Run #2	5.4 g	5.0 ml	100 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	69800	30000	20000	ug/kg	
71-43-2	Benzene	ND [a]	60	8.0	ug/kg	
100-41-4	Ethylbenzene	361000	3000	450	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	127000	15000	7900	ug/kg	
108-88-3	Toluene	1060 [a]	60	23	ug/kg	
1330-20-7	Xylene (total)	1270000	3000	550	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%	91%	67-131%
17060-07-0	1,2-Dichloroethane-D4	98%	97%	66-130%
2037-26-5	Toluene-D8	92%	90%	76-125%
460-00-4	4-Bromofluorobenzene	86%	80%	53-142%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-12(9.5-10.5)		
Lab Sample ID:	JA94124-1	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	87.4
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85804.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol [a]	40100	110	44	ug/kg	
67-56-1	Methanol	ND	230	59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	128%		58-137%
111-27-3	Hexanol	102%		58-137%

(a) More than 40 % RPD for detected concentrations between the two GC columns.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-13(12.5-13.5)		
Lab Sample ID:	JA94124-2	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	81.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118377.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.3 g
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	20.1	12	7.7	ug/kg	
71-43-2	Benzene	1.6	1.2	0.15	ug/kg	
100-41-4	Ethylbenzene	0.31 J	1.2	0.17	ug/kg	J
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.8	3.0	ug/kg	
108-88-3	Toluene	ND J	1.2	0.44	ug/kg	
1330-20-7	Xylene (total)	11.3 J	1.2	0.21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%		67-131%
17060-07-0	1,2-Dichloroethane-D4	86%		66-130%
2037-26-5	Toluene-D8	96%		76-125%
460-00-4	4-Bromofluorobenzene	93%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-13(12.5-13.5)		
Lab Sample ID:	JA94124-2	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	81.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85791.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	47	ug/kg	
67-56-1	Methanol	731	250	63	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	103%		58-137%
111-27-3	Hexanol	103%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-14(8.5-9.5)		
Lab Sample ID:	JA94124-3	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	79.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118374.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.3 g
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	12.0	12	7.9	ug/kg	
71-43-2	Benzene	0.42	1.2	0.16	ug/kg	J
100-41-4	Ethylbenzene	32.5 J	1.2	0.18	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.9	3.1	ug/kg	
108-88-3	Toluene	ND J	1.2	0.45	ug/kg	
1330-20-7	Xylene (total)	82.6 J	1.2	0.22	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%		67-131%
17060-07-0	1,2-Dichloroethane-D4	94%		66-130%
2037-26-5	Toluene-D8	97%		76-125%
460-00-4	4-Bromofluorobenzene	91%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-14(8.5-9.5)		
Lab Sample ID:	JA94124-3	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	79.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85797.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	130	48	ug/kg	
67-56-1	Methanol	ND	250	65	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	105%		58-137%
111-27-3	Hexanol	88%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-15(5-6)		
Lab Sample ID:	JA94124-4	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	83.1
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118375.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.9 g
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	7.8	10	6.8	ug/kg	J
71-43-2	Benzene	0.76	1.0	0.14	ug/kg	J
100-41-4	Ethylbenzene	0.38 J	1.0	0.15	ug/kg	J
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.1	2.7	ug/kg	
108-88-3	Toluene	ND J	1.0	0.39	ug/kg	
1330-20-7	Xylene (total)	7.5 J	1.0	0.19	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		67-131%
17060-07-0	1,2-Dichloroethane-D4	93%		66-130%
2037-26-5	Toluene-D8	97%		76-125%
460-00-4	4-Bromofluorobenzene	93%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-15(5-6)		
Lab Sample ID:	JA94124-4	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	83.1
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85798.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	45	ug/kg	
67-56-1	Methanol	ND	240	61	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	109%		58-137%
111-27-3	Hexanol	106%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-16(6-7)		
Lab Sample ID:	JA94124-5	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	86.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	E185935.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.9 g	5.0 ml	100 ul
Run #2			

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	570	380	ug/kg	
71-43-2	Benzene	ND	57	7.5	ug/kg	
100-41-4	Ethylbenzene	1840 J	57	8.4	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	249	280	150	ug/kg	J
108-88-3	Toluene	ND J	57	21	ug/kg	
1330-20-7	Xylene (total)	6040 J	57	10	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		67-131%
17060-07-0	1,2-Dichloroethane-D4	97%		66-130%
2037-26-5	Toluene-D8	95%		76-125%
460-00-4	4-Bromofluorobenzene	84%		53-142%

(a) Diluted due to high concentration of target compound.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-16(6-7)		
Lab Sample ID:	JA94124-5	**Date Sampled:**	12/07/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	86.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85799.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	44	ug/kg	
67-56-1	Methanol	ND	230	59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	105%		58-137%
111-27-3	Hexanol	103%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-17(10-11)		
Lab Sample ID:	JA94124-6	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	90.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E185928.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180
Run #2	E185932.D	10	12/14/11	OTR	12/09/11 13:00	n/a	VE8180

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	2.0 ul
Run #2	5.0 g	5.0 ml	1.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	30000	20000	ug/kg	
71-43-2	Benzene	ND	3000	400	ug/kg	
100-41-4	Ethylbenzene	1710000 [a]	60000	8900	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	34900	15000	7900	ug/kg	
108-88-3	Toluene	4420	3000	1100	ug/kg	
1330-20-7	Xylene (total)	5550000 [a]	60000	11000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%	93%	67-131%
17060-07-0	1,2-Dichloroethane-D4	98%	97%	66-130%
2037-26-5	Toluene-D8	92%	94%	76-125%
460-00-4	4-Bromofluorobenzene	82%	88%	53-142%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-17(10-11)		
Lab Sample ID:	JA94124-6	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	90.7
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85792.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	1220	110	41	ug/kg	
67-56-1	Methanol	301	220	56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	143% [a]		58-137%
111-27-3	Hexanol	111%		58-137%

(a) Outside control limits due to matrix interference. Confirmed by MS/MSD.

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-18(7-8)		
Lab Sample ID:	JA94124-7	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	85.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118378.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.5 g
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	7.7	11	7.0	ug/kg	J
71-43-2	Benzene	0.31	1.1	0.14	ug/kg	J
100-41-4	Ethylbenzene	1.7	1.1 J	0.16	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.3	2.8	ug/kg	
108-88-3	Toluene	ND	1.1 J	0.40	ug/kg	
1330-20-7	Xylene (total)	11.9	1.1 J	0.20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		67-131%
17060-07-0	1,2-Dichloroethane-D4	92%		66-130%
2037-26-5	Toluene-D8	96%		76-125%
460-00-4	4-Bromofluorobenzene	91%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-18(7-8)		
Lab Sample ID:	JA94124-7	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	85.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85800.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.2 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	110	43	ug/kg	
67-56-1	Methanol	ND	220	58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	114%		58-137%
111-27-3	Hexanol	107%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-19(8-9)		
Lab Sample ID:	JA94124-8	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	84.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118379.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.6 g
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	13.2	11	7.0	ug/kg	
71-43-2	Benzene	0.51	1.1	0.14	ug/kg	J
100-41-4	Ethylbenzene	7.8	1.1	0.16	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.3	2.8	ug/kg	
108-88-3	Toluene	ND	1.1	0.40	ug/kg	
1330-20-7	Xylene (total)	23.2	1.1	0.19	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	90%		67-131%
17060-07-0	1,2-Dichloroethane-D4	88%		66-130%
2037-26-5	Toluene-D8	96%		76-125%
460-00-4	4-Bromofluorobenzene	92%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	I-19(8-9)		
Lab Sample ID:	JA94124-8	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	84.6
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85801.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	44	ug/kg	
67-56-1	Methanol	ND	230	60	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	104%		58-137%
111-27-3	Hexanol	101%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB120811		
Lab Sample ID:	JA94124-9	**Date Sampled:**	12/08/11
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/11
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4B13608.D	1	12/12/11	RS	n/a	n/a	V4B588
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	7.6	ug/l	
71-43-2	Benzene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.21	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.2	ug/l	J
108-88-3	Toluene	ND	1.0	0.15	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		77-120%
17060-07-0	1,2-Dichloroethane-D4	90%		70-127%
2037-26-5	Toluene-D8	93%		79-120%
460-00-4	4-Bromofluorobenzene	85%		76-118%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	EB120811		
Lab Sample ID:	JA94124-9	**Date Sampled:**	12/08/11
Matrix:	AQ - Equipment Blank	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85784.D	1	12/13/11	XPL	n/a	n/a	GGH3920
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	100	30	ug/l	
67-56-1	Methanol	ND	200	46	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	103%		48-150%
111-27-3	Hexanol	104%		48-150%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-9(4.5-6)		
Lab Sample ID:	JA94124-10	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	87.5
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E185930.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180
Run #2	E185934.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180
Run #3	E185936.D	10	12/14/11	OTR	12/09/11 13:00	n/a	VE8180

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.9 g	5.0 ml	100 ul
Run #2	5.9 g	5.0 ml	2.0 ul
Run #3	5.9 g	5.0 ml	4.0 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	25700 [a]	28000	18000	ug/kg	J
71-43-2	Benzene	46.2	56	7.4	ug/kg	J
100-41-4	Ethylbenzene	488000 [a]	2800	410	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	850000 [b]	69000	37000	ug/kg	
108-88-3	Toluene	1840	56	21	ug/kg	
1330-20-7	Xylene (total)	1750000 [b]	14000	2600	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
1868-53-7	Dibromofluoromethane	91%	92%	92%	67-131%
17060-07-0	1,2-Dichloroethane-D4	97%	96%	98%	66-130%
2037-26-5	Toluene-D8	87%	92%	91%	76-125%
460-00-4	4-Bromofluorobenzene	81%	85%	86%	53-142%

(a) Result is from Run# 2
(b) Result is from Run# 3

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-9(4.5-6)		
Lab Sample ID:	JA94124-10	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	87.5
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85805.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	7390	110	44	ug/kg	
67-56-1	Methanol	2680	230	59	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	95%		58-137%
111-27-3	Hexanol	96%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-8(4-5)		
Lab Sample ID:	JA94124-11	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	81.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118380.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2							

	Initial Weight
Run #1	5.7 g
Run #2	

VOA Special List

CAS No.	Compound	Result		RL	MDL	Units	Q
67-64-1	Acetone	ND		11	7.1	ug/kg	
71-43-2	Benzene	ND		1.1	0.14	ug/kg	
100-41-4	Ethylbenzene	ND	J	1.1	0.16	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND		5.4	2.8	ug/kg	
108-88-3	Toluene	ND	J	1.1	0.41	ug/kg	
1330-20-7	Xylene (total)	ND	J	1.1	0.20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		67-131%
17060-07-0	1,2-Dichloroethane-D4	98%		66-130%
2037-26-5	Toluene-D8	98%		76-125%
460-00-4	4-Bromofluorobenzene	91%		53-142%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-8(4-5)		
Lab Sample ID:	JA94124-11	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	81.3
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85806.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.1 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	46	ug/kg	
67-56-1	Methanol	257	240	62	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	83%		58-137%
111-27-3	Hexanol	85%		58-137%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-5(4.5-5.5)		
Lab Sample ID:	JA94124-12	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846 8260B SW846 5035	**Percent Solids:**	83.9
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y118381.D	1	12/10/11	RS	12/09/11 13:00	n/a	VY5057
Run #2	E185933.D	1	12/14/11	OTR	12/09/11 13:00	n/a	VE8180

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.8 g		
Run #2	5.9 g	5.0 ml	100 ul

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	10	10	6.8	ug/kg	
71-43-2	Benzene	0.47	1.0	0.14	ug/kg	J
100-41-4	Ethylbenzene	3830 [a] J	60	8.9	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	195	5.1	2.7	ug/kg	
108-88-3	Toluene	2.4 J	1.0	0.39	ug/kg	
1330-20-7	Xylene (total)	11800 [a] J	60	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%	91%	67-131%
17060-07-0	1,2-Dichloroethane-D4	89%	98%	66-130%
2037-26-5	Toluene-D8	95%	92%	76-125%
460-00-4	4-Bromofluorobenzene	90%	85%	53-142%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P-5(4.5-5.5)		
Lab Sample ID:	JA94124-12	**Date Sampled:**	12/08/11
Matrix:	SO - Soil	**Date Received:**	12/09/11
Method:	SW846-8015 (DAI)	**Percent Solids:**	83.9
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GH85807.D	1	12/13/11	XPL	n/a	n/a	GGH3921
Run #2							

	Initial Weight
Run #1	5.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
67-63-0	Isopropyl Alcohol	ND	120	45	ug/kg	
67-56-1	Methanol	ND	240	61	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
111-27-3	Hexanol	100%		58-137%
111-27-3	Hexanol	101%		58-137%

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ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	FB120811		
Lab Sample ID:	JA94124-13	**Date Sampled:**	12/08/11
Matrix:	AQ - Field Blank Soil	**Date Received:**	12/09/11
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4B13609.D	1	12/12/11	RS	n/a	n/a	V4B588
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	7.6	ug/l	
71-43-2	Benzene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.21	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND J	5.0	1.2	ug/l	
108-88-3	Toluene	ND	1.0	0.15	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		77-120%
17060-07-0	1,2-Dichloroethane-D4	91%		70-127%
2037-26-5	Toluene-D8	93%		79-120%
460-00-4	4-Bromofluorobenzene	85%		76-118%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TB120811		
Lab Sample ID:	JA94124-14	**Date Sampled:**	12/08/11
Matrix:	AQ - Trip Blank Soil	**Date Received:**	12/09/11
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	BMS-ICM, Humacao, PR		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4B13610.D	1	12/12/11	RS	n/a	n/a	V4B588
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	7.6	ug/l	
71-43-2	Benzene	ND	1.0	0.22	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.21	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.2	ug/l	J
108-88-3	Toluene	ND	1.0	0.15	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.17	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		77-120%
17060-07-0	1,2-Dichloroethane-D4	90%		70-127%
2037-26-5	Toluene-D8	92%		79-120%
460-00-4	4-Bromofluorobenzene	86%		76-118%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

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Bottle Order Control #:
Accutest Quote #:
Accutest Job #: JA94124

Client / Reporting Information

Company Name: Anderson Mulholland Assoc., Inc.
Street Address: 110 Corporate Park
City: White Plains State: NY Zip: 10604
Project Contact: Terry Taylor E-mail:
Phone #: 914-251-0400 Ext. 309 Fax #:
Sampler(s) Name(s): Terry Talylor/Nestor Rivera Phone #:

Project Information

Project Name: Bristol-Myers Squibb, Humacao PR
Street:
City: State:
Project #: Building 5
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL - Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB-Field Blank, EB-Equipment Blank, RB- Rinse Blank, TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Ethylbenzene, benzene, toluene, xylene, MIBK, acetone by 8260B	Methanol and IPA by 8015B	% solids	LAB USE ONLY
-1	I-12 (9.5-10.5)		12/7/11	1330	TT	Soil	5					2			3	X	X	X	
-2	I-13 (12.5-13.5)			1415			5					2			3	X	X	X	FS.2
-3	I-14 (8.5-9.5)			1515			5					2			3	X	X	X	1406
-4	I-15 (5-6)			1600			5					2			3	X	X	X	4973
-5	I-16 (6-7)			1640			5					2			3	X	X	X	819
-6	I-17 (10-11)		12/8/11	940			5					2			3	X	X	X	
-7	I-18 (7-8)			1115			5					2			3	X	X	X	
-8	I-19 (8-9)			1200			5					2			3	X	X	X	
-9	EB 120811			1305		EB	2	2								X	X		
-10	P-9 (4.5-6)			1340		Soil	5					2			3	X	X	X	
-11	P-8 (4-5)			1415			5					2			3	X	X	X	
-12	P-5 (4.5-5.5)			1445			5					2			3	X	X	X	

Turnaround Time (Business days)

- [ ] Std. 15 Business Days
- [ ] Std. 10 Business Days (by Contract only)
- [ ] 10 Day *RUSH*
- [ ] 5 Day *RUSH*
- [x] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

3 day 12/9/11

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	12/8/11 1640	1 FedEx	2 FedEx	12/9/11 1000	2
3		3	4		4

Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice	Cooler Temp.
5		5	432 [x] Intact [ ] Not intact	X	X	4.0°C

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

2235 Route 130, Dayton, NJ 08810
Tel: 732-329-0200 FAX: 732-329-3499/3480
www. acutest.com

8708259214 74

Bottle Order Control #:
Accutest Quote #:
Accutest Job #: JA94124

Client / Reporting Information

Company Name: Anderson Mulholland Assoc., Inc.
Street Address: 110 Corporate Park
City, State, Zip: White Plains, NY 10604
Project Contact: Terry Taylor
E-mail:
Phone #: 914-251-0400 Ext. 309
Fax #:
Sampler(s) Name(s): Terry Taylor / Nestor Rivera
Phone #:

Project Information

Project Name: Bristol-Myers Squibb, Humacao PR
Street:
City:
State:
Project #: Building 5
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City:
State:
Zip:
Attention:

Requested Analysis (see TEST CODE sheet): Ethylbenzene, benzene, toluene, xylene, MIBK, acetone by 8260B; Methanol and IPA by 8015B; % solids

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Ethylbenzene, benzene, toluene, xylene, MIBK, acetone by 8260B	Methanol and IPA by 8015B	% solids	LAB USE ONLY
-13	FB120811		12/8/11	1500	TT	FB	2	2								X			
-14	TB120811		↓	1500	↓	TB	2	2								X			

Matrix Codes
DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL - Sludge
SED - Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB - Field Blank
EB - Equipment Blank
RB - Rinse Blank
TB - Trip Blank

Turnaround Time (Business days)

- [ ] Std. 15 Business Days
- [ ] Std. 10 Business Days (by Contract only)
- [ ] 10 Day RUSH
- [ ] 5 Day RUSH
- [x] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

OG/LEO 11-28-11 EUD
12-9-11

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	12/8/11 : 1640	1 Fed Ex	2 Fed Ex	12-9-11 1000	2 [signature]
3		3	4		4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # 432 ☐ Intact ☐ Not intact	Preserved where applicable ☒	On Ice ☒ Cooler Temp.

Project Number:____JA94124_____
Date:____12/07-08/2011_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Validating Volatile Organic Compounds by GC/MS, SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998)," specifically for Methods 8000/8015 are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JA94124_____ Sample matrix: ___Soil_____
No. of Samples: _____12_____

Trip blank No.: _____
Field blank No.: _____-_____
Equipment blank No.:__JA94124-9_____
Field duplicate No.:_____

___X___ Data Completeness
___X___ Holding Times
___N/A_ GC/MS Tuning
___N/A_ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_IPA_and_Methanol_by_SW846-8015_(DAI)_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__12/20/2011_____

DATA REVIEW WORKSHEETS

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __N/A___
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__N/A_ The BFB performance results were reviewed and found to be within the specified criteria.

__N/A_ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:
_____

If mass calibration is in error, all associated data are rejected.

All criteria were met __X___
Criteria were not met
and/or see below _____

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____11/12/11_____
Dates of continuing calibration:_12/13/11_____
Instrument ID numbers:_____GCGH_____
Matrix/Level:__Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, **%D**, r	COMPOUND	SAMPLES AFFECTED
Initial and continuing calibration meet method performance criteria				

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be $\leq$ 15 % regardless of method requirements for CCC.
All %Ds must be $\leq$ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of $\geq$ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_target_analytes_detected_in_the_equipment_blank_analyzed_with_this_data_package.				
No_trip/equipment_blanks_analyzed_with_this_data_package				

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met _____
Criteria were not met
and/or see below _X___

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	~~1,2-DCA~~	~~DBFM~~	~~TOL-d8~~	~~BFB~~	
JA94124-6	143 %				No action
Recoveries OK in signal #2; Confirmed GC/MS					
JA94124-6MS	235				No action
JA94124-6MS	213				No action
Matrix interference. Recoveries OK in signal #2;					
Surrogate - Hexanol					I

QC Limits* (Aqueous)

LL to UL	to	to	to	to

QC Limits* (Solid-Low)

LL to UL	58 to 137	to	to	to

QC Limits* (Solid-Med)

LL to UL	to	to	to	to

1,2-DCA = 1,2-Dichloromethane-d4
DBFM = Dibromofluoromethane
TOL-d8 = Toluene-d8
BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.

If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met __X___
Criteria were not met
and/or see below _____

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed. List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JA94124-6_____ Matrix/Level:___SOIL_____

MS OR MSD COMPOUND % R RPD QC LIMITS ACTION

__MS/MSD_recoveries_and_RPD_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID	COMPOUND	% R	QC LIMIT

___Recoveries_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X___
Criteria were not met
and/or see below _____

IX. FIELD DUPLICATE PRECISION

Sample IDs: __none_____ Matrix:_SOIL_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
No field/laboratory duplicate analyzed as part of this data package. MS/MSD results used to assess precision. RPD within laboratory and generally acceptable control limits					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __N/A__
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X___
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JA94124-2

Methanol RF = 13.07

[ ] = (10921)/(13.07)

= 835,6 ppb OK

More than 40 % RPD for detected Isopropyl Alcohol concentrations between the two GC columns in samples JA94124-1. Results qualified as estimated (J).

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION

B. Percent Solids

List samples which have ≤ 50 % solids

_____
_____
_____
_____
_____
_____

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)

Project Number:____JA94124_____
Date:____12/07-08/2011_____

REVIEW OF VOLATILE ORGANIC PACKAGE

The following guidelines for evaluating volatile organics were created to delineate required validation actions. This document will assist the reviewer in using professional judgment to make more informed decision and in better serving the needs of the data users. The sample results were assessed according to USEPA data validation guidance documents in the following order of precedence: USEPA Region 2, SOP HW-24, Validating Volatile Organic Compounds by GC/MS, SW-846 Method 8260B (August, 2009-Revision 2), the USEPA National Functional Guidelines for Low/Medium Concentration Organic Data Review (SOW SOM01.2 SOP HW-33, August 2009 – Revision 2), the USEPA National Functional Guidelines for Organic Data Review for Low Concentration (SOP HW-13, August, 2009-Revision 3). Also, QC criteria from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 (Final Update IV, December 1998)," specifically for Methods 8000/8260B are utilized. The QC criteria and data validation actions listed on the data review worksheets are from the primary guidance document, unless otherwise noted.
The hardcopied (laboratory name) _Accutest_____ data package received has been reviewed and the quality control and performance data summarized. The data review for VOCs included:

Lab. Project/SDG No.: __JA94124_____ Sample matrix: ___Soil_____
No. of Samples: _____14_____

Trip blank No.: ____JA94124-14_____
Field blank No.: ____JA94124-13_____
Equipment blank No.:_JA94124-9_____
Field duplicate No.:_____

___X___ Data Completeness
___X___ Holding Times
___X___ GC/MS Tuning
___X___ Internal Standard Performance
___X___ Blanks
___X___ Surrogate Recoveries
___X___ Matrix Spike/Matrix Spike Duplicate
___X___ Laboratory Control Spikes
___X___ Field Duplicates
___X___ Calibrations
___X___ Compound Identifications
___X___ Compound Quantitation
___X___ Quantitation Limits

Overall Comments:_Selected_VOC's_by_SW846-8260B_____
_____

Definition of Qualifiers:
J- Estimated results
U- Compound not detected
R- Rejected data
UJ- Estimated nondetect

Reviewer:_____
Date:__12/22/2011_____

DATA COMPLETENESS

MISSING INFORMATION	DATE LAB. CONTACTED	DATE RECEIVED

All criteria were met __X__
Criteria were not met
and/or see below _____

HOLDING TIMES

The objective of this parameter is to ascertain the validity of the results based on the holding time of the sample from time of collection to the time of analysis.

Complete table for all samples and note the analysis and/or preservation not within criteria

SAMPLE ID	DATE SAMPLED	DATE ANALYZED	pH	ACTION
All samples analyzed within the recommended method holding time				

Criteria

Aqueous samples – 14 days from sample collection for preserved samples (pH $\leq$ 2, 4°C), no air bubbles.
Aqueous samples – 7 days from sample collection for unpreserved samples, 4°C, no air bubbles.
Soil samples- 7 days from sample collection.
Cooler temperature (Criteria: 4 $\pm$ 2 °C): 4°C - OK

Actions

If the VOCs vial(s) have air bubbles, estimate positive results (J) and reject nondetects (R).
If the % solids of soil samples is 10-50%, estimates positive results (J) and nondetects (UJ)
If the % solid of soil samples is < 10%, estimate positive results (J) and reject nondetects (R).
If holding times are exceeded but < 14 days beyond criteria, estimate positive results (J) and nondetects (UJ).
If holding times are exceeded but < 28 days beyond criteria, estimate positive results (J) and reject nondetects (R).
If holding times are grossly exceeded (> 28 days beyond criteria), reject all results (R).
If samples were not iced or if the ice were melted (> 10°C), estimate positive results (J) and nondetects (UJ).

All criteria were met __X___
Criteria were not met see below _____

GC/MS TUNING

The assessment of the tuning results is to determine if the sample instrumentation is within the standard tuning QC limits

__X___ The BFB performance results were reviewed and found to be within the specified criteria.

__X___ BFB tuning was performed for every 12 hours of sample analysis.

If no, use professional judgment to determine whether the associated data should be accepted, qualified or rejected.

List the samples affected:
_____

If mass calibration is in error, all associated data are rejected.

All criteria were met ____
Criteria were not met
and/or see below __X__

CALIBRATION VERIFICATION

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing and maintaining acceptable quantitative data.

Date of initial calibration:_____09/14/11_____11/12/11_____11/08/11_____
Dates of continuing calibration:_12/12/11_____12/14/11_____12/10/11_____
Instrument ID numbers:_____GCMS4B____GCMSE_____GCMSY_____
Matrix/Level:__Aqueous/low_____

DATE	LAB FILE ID#	CRITERIA OUT RFs, %RSD, **%D**, r	COMPOUND	SAMPLES AFFECTED
12/08/2011	cc435-20	-23.6	MIBK	JA94124-9;-13;-14

Criteria

All RFs must be > 0.05 regardless of method requirements for SPCC.
All %RSD must be $\leq$ 15 % regardless of method requirements for CCC.
All %Ds must be $\leq$ 20% regardless of method requirements for CCC.
It should be noted that Region 2 SOP HW-24 does not specify criterion for the curve correlation coefficient (r). A limit for r of $\geq$ 0.995 has therefore been utilized as professional judgment.

Actions

If any compound has an initial RF or a continuing RF of < 0.05, estimate positive results (J) and reject nondetects (R), regardless of method requirements.
If any compound has a %RSD > 15%, estimate positive results (J) and use professional judgment to qualify nondetects.
If any compound has a %RSD > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and reject nondetects (R).
If any compound has a % D > 20%, estimate positive results (J) and nondetects (UJ).
If any compound has a % D > 90%, estimate positive results (J) and reject nondetects (R).
If any compound has r > 0.995, estimate positive results and nondetects.

A separate worksheet should be filled for each initial curve

All criteria were met __X__
Criteria were not met
and/or see below _____

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

The assessment of the blank analysis results is to determine the existence and magnitude of contamination problems. The criteria for evaluation of blanks apply only to blanks associated with the samples, including trip, equipment, and laboratory blanks. If problems with any blanks exist, all data associated with the case must be carefully evaluated to determine whether or not there is an inherent variability in the data for the case, or if the problem is an isolated occurrence not affecting other data.

List the contamination in the blanks below. High and low levels blanks must be treated separately.

Laboratory blanks

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
All_method_blank_meeth_method_specific_criteria				

Field/Equipment/Trip blank

DATE ANALYZED	LAB ID	LEVEL/ MATRIX	COMPOUND	CONCENTRATION UNITS
No_target_analytes_detected_in_the_trip/field/equipment_blanks_analyzed_with_this_data package.				

All criteria were met __X__
Criteria were not met
and/or see below _____

V B. BLANK ANALYSIS RESULTS (Section 3)

Blank Actions

Action Levels (ALs) should be based upon the highest concentration of contaminant determined in any blank. Do not qualify any blank with another blank. The ALs for samples which have been diluted should be corrected for the sample dilution factor and/or % moisture, where applicable. No positive sample results should be reported unless the concentration of the compound in the samples exceeds the ALs:

ALs = 10x the amount of common contaminants (methylene chloride, acetone, 2-butanone, and toluene)
ALs = 5x for any other compounds

Specific actions are as follows:

If the concentration is < sample quantitation limit (SQL) and ≤ AL, report the compound as not detected (U) at the SQL.
If the concentration is ≥ SQL but ≤ AL, report the compound as not detected (U) at the reported concentration.
If the concentration is ≥ SQL and > AL, report the concentration unqualified.

Notes:

High and low level blanks must be treated separately
Compounds qualified "U" for blank contamination are still considered "hits" when qualifying for calibration criteria.

CONTAMINATION SOURCE/LEVEL	COMPOUND	CONC/UNITS	AL/UNITS	SQL	AFFECTED SAMPLES

All criteria were met _X_
Criteria were not met
and/or see below _____

SURROGATE SPIKE RECOVERIES

Laboratory performance of individual samples is established by evaluation of surrogate spike recoveries. All samples are spiked with surrogate compounds prior to sample analysis. The accuracy of the analysis is measured by the surrogate percent recovery. Since the effects of the sample matrix are frequently outside the control of the laboratory and may present relatively unique problems, the validation of data is frequently subjective and demands analytical experience and professional judgment.
List the percent recoveries (%Rs) which do not meet the criteria for surrogate recovery.
Matrix: solid/aqueous

SAMPLE ID	SURROGATE COMPOUND				ACTION
	1,2-DCA	DBFM	TOL-d8	BFB	
_All_surrogate_recoveries_within_laboratory_control_limits					

QC Limits* (Aqueous)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Low)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____
QC Limits* (Solid-Med)
_____LL_to_UL___ ____to_____ ___to_____ ___to_____ ___to_____

1,2-DCA = 1,2-Dichloromethane-d4 TOL-d8 = Toluene-d8
DBFM = Dibromofluoromethane BFB = Bromofluorobenzene

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 80 – 120 % for aqueous and 70 – 130 % for solid samples.

Actions:

QUALITY	%R < 10%	%R = 10% - LL	%R > UL
Positive results	J	J	J
Nondetects results	R	UJ	Accept

Surrogate action should be applied:
If one or more surrogate in the VOC fraction is out of specification, but has a recovery of > 10%.
If any one surrogate in a fraction shows < 10 % recovery.

All criteria were met ___
Criteria were not met
and/or see below __X___

VII. A MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

This data is generated to determine long term precision and accuracy in the analytical method for various matrices. This data alone cannot be used to evaluate the precision and accuracy of individual samples. If any % R in the MS or MSD falls outside the designated range, the reviewer should determine if there are matrix effects, i.e. LCS data are within the QC limits but MS/MSD data are outside QC limit.

1. MS/MSD Recoveries and Precision Criteria

The laboratory should use one MS and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If target analytes are not expected, MS/MSD should be analyzed. List the %Rs, RPD of the compounds which do not meet the criteria.

Sample ID:__JA93776-3_____ Matrix/Level:___AQUEOUS_____
Sample ID:__JA94124-3_____ Matrix/Level:___SOIL_____
Sample ID:__JA94124-5_____ Matrix/Level:___SOIL_____

MS OR MSD JA94124-5	COMPOUND	% R	RPD	QC LIMITS	ACTION
__MS_____	Ethylbenzene_____	172_____		20_-_144_____	Qualify_results_(J)_
__MS_____	Toluene_____	146_____		29_-_138_____	affected_samples___
__MS_____	Xylenes(Total)_____	176_____		18_-_145_____	

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

MS/MSD criteria apply only to the unspiked sample, its dilutions, and the associated MS/MSD samples:

If the % R for the affected compounds were < LL (or 70 %), qualify positive results (J) and nondetects (UJ).
If the % R for the affected compounds were > UL (or 130 %), only qualify positive results (J).
If 25 % or more of all MS/MSD %R were < LL (or 70 %) or if two or more MS/MSD %Rs were < 10%, qualify all positive results (J) and reject nondetects (R).

A separate worksheet should be used for each MS/MSD pair.

All criteria were met __X__
Criteria were not met
and/or see below _____

VII. B MATRIX SPIKE/MATRIX SPIKE DUPLICATE

MS/MSD – Unspiked Compounds

It should be noted that Region 2 SOP HW-24 does not specify a MS/MSD criteria for the unspiked compounds in the sample. A %RSD of < 50% has therefore been utilized as professional judgment.

If all target analytes were spiked in the MS/MSD, this review element is not applicable.

List the %RSD of the compounds which do not meet the criteria.

Sample ID:_____ Matrix/Level/Unit:_____

COMPOUND	SAMPLE CONC.	MS CONC.	MSD CONC.	% RSD	ACTION

Actions:

* If the % RSD > 50, qualify the positive result in the unspiked samples as estimated (J).
* If the % RSD is not calculated (NC) due to nondetected value, use professional judgment to qualify the data.

All criteria were met __X__
Criteria were not met
and/or see below _____

VIII. LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

This data is generated to determine accuracy of the analytical method for various matrices.

1. LCS Recoveries Criteria

Where LCS spiked with the same analyte at the same concentrations as the MS/MSD? Yes or No. If no make note in data review memo.
List the %R of compounds which do not meet the criteria

LCS ID COMPOUND % R QC LIMIT

___Recoveries_within_laboratory_control_limits_____

* QC limits are laboratory in-house performance criteria, LL = lower limit, UL = upper limit.
* If QC limits are not available, use limits of 70 – 130 %.

Actions:

QUALITY	%R < LL	%R > UL
Positive results	J	J
Nondetects results	R	Accept

All analytes in the associated sample results are qualified for the following criteria.

If 25 % of the LCS recoveries were < LL (or 70 %), qualify all positive results (j) and reject nondetects (R).
If two or more LCS were below 10 %, qualify all positive results as (J) and reject nondetects (R).

2. Frequency Criteria:

Where LCS analyzed at the required frequency and for each matrix? Yes or No.
If no, the data may be affected. Use professional judgment to determine the severity of the effect and qualify data accordingly. Discuss any actions below and list the samples affected.

All criteria were met __X__
Criteria were not met
and/or see below _____

IX. LABORATORY DUPLICATE PRECISION

Sample IDs: __JA94124-4_____ Matrix:_SOIL_____

Field duplicates samples may be taken and analyzed as an indication of overall precision. These analyses measure both field and lab precision; therefore, the results may have more variability than laboratory duplicates which only laboratory performance. It is also expected that soil duplicate results will have a greater variance than water matrices due to difficulties associated with collecting identical field duplicate samples.

The project QAPP should be reviewed for project-specific information.
Suggested criteria: RPD ± 30% for aqueous samples, RPD ± 50 % for solid samples. If both samples and duplicate are <5 SQL, the RPD criteria is doubled.

COMPOUND	SQL	SAMPLE CONC.	DUPLICATE CONC.	RPD	ACTION
Benzene	0.14	0.76	0.31	84	Qualify results (J) in sample JA94124
Ethylbenzene	0.15	0.38	ND	200	
Xylene(total)	0.19	7.5	2.0	116	
Note: laboratory states that "High RPD due to possible sample analyzed from different vials"; therefore results qualified based on professional judgment					

Actions:

Qualify as estimated positive results (J) and nondetects (UJ) for the compound that exceeded the above criteria. For organics, only the sample and duplicate will be qualified.

If an RPD cannot be calculated because one or both of the sample results is not detected, the following actions apply:

If one sample result is not detected and the other is greater than 5x the SQL qualify (J/UJ).

If one sample value is not detected and the other is greater than 5x the SQL and the SQLs for the sample and duplicate are significantly different, use professional judgment to determine if qualification is appropriate.

If one sample value is not detected and the other is less than 5x, use professional judgment to determine if qualification is appropriate.

If both sample and duplicate results are not detected, no action is needed.

All criteria were met __X__
Criteria were not met
and/or see below _____

X. INTERNAL STANDARD PERFORMANCE

The assessment of the internal standard (IS) parameter is used to assist the data reviewer in determining the condition of the analytical instrumentation.

List the internal standard area of samples which do not meet the criteria.

* Area of +100% or -50% of the IS area in the associated calibration standard.
* Retention time (RT) within 30 seconds of the IS area in the associated calibration standard.

DATE	SAMPLE ID	IS OUT	IS AREA	ACCEPTABLE RANGE	ACTION

_Internal_standard_area_within_laboratory_control_limits_____

Actions:

1. IS actions should be applied to the compound quantitated with the out-of-control ISs

QUALITY	IS AREA < -25%	IS AREA = -25 % TO – 50%	IS AREA > + 100%
Positive results	J	J	J
Nondetected results	R	UJ	ACCEPT

2. If a IS retention time varies more than 30 seconds, the chromatographic profile for that sample must be examined to determine if any false positive or negative exists. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for the sample fraction.

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. SAMPLE QUANTITATION

The sample quantitation evaluation is to verify laboratory quantitation results. In the space below, please show a minimum of one sample calculation:

JA94124-1

ACETONE RF = 0.071

[ ] = (231223)(50)/(168133)(0.071)

= 968.5 ppb OK

All criteria were met __X__
Criteria were not met
and/or see below _____

XII. QUANTITATION LIMITS

A. Dilution performed

SAMPLE ID	DILUTION FACTOR	REASON FOR DILUTION
JA94124-6	10 x	Ethylbenzene and total xylenes outside calibration range
JA94124-10	10 x	MIBK and total xylenes outside calibration range

B. Percent Solids

List samples which have $\leq$ 50 % solids

Actions:

If the % solids of a soil sample is 10-50%, estimate positive results (J) and nondetects (UJ)

If the % solids of a soil sample is < 10%, estimate positive results (J) and reject nondetects (R)